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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,310	11/13/2001	Elias Georges	112418.122	5815

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EXAMINER	
GABEL, GAILENE	

ART UNIT	PAPER NUMBER
1641	

DATE MAILED: 05/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,310	GEORGES, ELIAS	
	Examiner	Art Unit	
	Gailene R. Gabel	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) *42-50,52,55,56,58-69 and 72* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10,12-17,19,20,24,26,29-34,36,40 and 75-77* is/are rejected.

7)☒ Claim(s) *23 and 39* is/are objected to.

8)☒ Claim(s) *See Continuation Sheet* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 10,12-17,19,20,23,24,26,29-34,36,39,40,42-50,52,55,56,58-69,72 and 75-77.

Continuation of Disposition of Claims: Claims subject to restriction and/or election requirement are 10,12-17,19,20,23,24,26,29-34,36,39,40,42-50,52,55,56,58-69,72 and 75-77.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 3, 2006 has been entered.

Amendment Entry

2. Applicant's amendment filed February 3, 2006 is acknowledged and has been entered. Claims 10, 26, and 77 have been amended. Claims 11, 27, and 78 have been cancelled. Claims 42-50, 52, 55, 56, 58-69, and 72 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being claims drawn to a non-elected invention. Accordingly, claims 10, 12-17, 19, 20, 23, 24, 26, 29-34, 36, 39, 40, 42-50, 52, 55, 56, 58-69, 72, and 75-77 are pending in the application. Claims 10, 12-17, 19, 20, 23, 24, 26, 29-34, 36, 39, 40, and 75-77 are under examination.

Withdrawn Rejections

3. All rejections not reiterated herein, have been withdrawn.

4. The rejections of claims 11, 27, and 78 are now moot in light of Applicant's cancellation of the claims.

5. In light of Applicant's argument, the rejection of claims 10, 12-17, 19, 20, 23, 24, 26, 29-34, 36, 39, 40, and 75-77 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement, is hereby withdrawn.

6. In light of Applicant's amendment and arguments, the rejection of claims 10, 12-17, 19, 23, 26, 29-34, 39, and 75-77 under 35 U.S.C. 103(a) as being unpatentable over Geysen (US 5,595,915) in view of Miwa (EP 0818467 A2), is hereby withdrawn.

7. In light of Applicant's amendment and arguments, the rejection of claims 10, 12-17, 20, 24, 26, 29-34, 36, 40, and 75-77 under 35 U.S.C. 103(a) as being unpatentable over Georges et al. (Topology of P-glycoprotein as Determined by Epitope Mapping of MRK-16 Monoclonal Antibody, The Journal of Biological Chemistry 268 (3): 1792-1798 (1993)) in view of Miwa (EP 0818467 A2), is hereby withdrawn.

New Grounds of Rejection

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10 and 26 have been amended to recite that a first set and a second set of contiguous overlapping peptides are attached to a support, each one comprising a peptide region that binds to a polypeptide with a high affinity, the first set and the second set being discontinuous and wherein the segment adjacent therebetween that separates them comprises a repulsive peptide region. The specification at page 2, column 2, [0015], page 9, [0089], and Figure 1 of the published application, provides Applicant's novel concept whereby *the interactions between two proteins are mediated by strings of discontinuous high-affinity binding and high-repulsive forces* scattered throughout the 3D sequence of proteins which can be isolated using the overlapping peptide approach. According to Applicant, the size of the overlapping peptides is significant in the scanning overlapping peptide approach of the present invention for identifying these strings of discontinuous high-affinity binding and high-repulsive forces because 1) four contiguous amino acids significantly increases the low affinity binding, and 2) larger peptides having 20 amino acids or higher would be expected to increase the proportion of repulsive amino acids to high affinity amino acids, thereby masking or totally inhibiting the binding of specific proteins to the peptides. Accordingly, it is preferred that the size for the overlapping peptides is between 5 and 15 amino acids, or between 5 and 12 amino acids, or between 5 and 10 amino acids. Page 2-3, [0022] and page 10, [0092]. According to Applicant, using the scanning overlapping peptide approach of the present invention allows one to be able to identify all functional domains of a protein and its associated proteins; the high affinity binding sequences can be easily identified; the advantage thereof, being that one does not know a priori what

exact sequence of a given protein will contain the high affinity binding sites and the repulsive sequences. Page 10, [0091], [0092], and [0101]. Upon identifying a region of a chosen protein as a region which is involved in high affinity protein interactions, in vitro mutagenesis or testing of related peptide sequences of this region can be performed, in order to identify and dissect the structure or function relation of this region. When the interaction domains of two proteins have been identified, it is thus possible for the skilled artisan to identify and/or design variants having a modified affinity for interacting protein. Page 5, column 2, [0052].

8. Claims 10, 12-17, 19, 26, 29-34, and 75-77 are rejected under 35 U.S.C. 102(b) as being inherently anticipated by Geysen (US 5,595,915).

Geysen discloses a method for identifying binding or interaction, i.e. antigenically active, between peptides from a chosen (known or selected) protein and a polypeptide (antibody) (see Abstract and Figure 1). Geysen teaches synthetically synthesizing a plurality of peptides from the chosen protein, and covalently attaching a set of peptide segments to a support. The set of peptide segments overlap in parallel, in amino acid sequences and span a complete sequence of a domain of the protein (see column 1, lines 28-57, column 2, lines 49-64, column 3, lines 5-20, and claim 8). Geysen teaches that the peptide segment range is preferably between 6-8 amino acids in length (see column 2, lines 12-24). The support for immobilizing the overlapping peptides may be any one of solid polymer rod or microtiter well plate (see column 3, lines 5-30). The aligned and overlapping peptides are first incubated with antibodies to allow binding of the peptides with the antibodies. The support is washed to remove unbound antibodies.

Binding between the peptides and antibodies retained on the support is detected and identified (see column 1, lines 29-61 and column 5, lines 20-23 and 55-59). Geysen specifically teaches that the method can ascertain a high degree of specificity of a polypeptide to identify a specific peptide segment or amino acid sequence (see column 1, line 62 to column 2, line 2). The peptide to which the polypeptide binds can be identified by labeling the polypeptide and identifying the labeled polypeptide using assay methods, i.e. ELISA, RIA, and detection devices (see column 3, line 31-35).

In as far as the recitation of high affinity peptide regions and repulsive peptide regions in claims 10 and 26, it is provided in the specification and the dependent claims, that use of overlapping peptides that range between about 5 amino acids to about 15 amino acids, as taught by Geysen, allows one to identify "a first set of contiguous overlapping peptides attached to a support ..." that binds a polypeptide, and "a second set of contiguous overlapping peptides attached to the support ..." that binds the polypeptide, the first set being discontinuous from the second set. It appears that the Geysen reference which teaches synthesizing a plurality of peptide segments that overlap in parallel, the peptide segment range of which is between 6-8 amino acids in length, reads on the claimed method since Geysen provides hydrophilic and antigenic peptide regions and hydrophobic peptide regions, wherein binding and non-binding occurs, respectively. As recited, the [high] affinity peptide region and [high] repulsive peptide region are consonant to Geysen's hydrophilic and hydrophobic peptide regions, respectively, absent specific definition or determination of degree of affinity and degree of repulsion in the instant claims, which would render Applicant's claimed invention

distinct from that taught by prior art. Perhaps, Applicant intends, *1) "determining that the first set [of contiguous overlapping peptides that bind the polypeptide] comprises a first region that binds to the polypeptide with a high affinity", 2) "determining that the second set [of contiguous overlapping peptides that bind the polypeptide] comprises a second region that binds to the polypeptide with a high affinity" ... the second set being discontinuous from the first set, and 3) "determining that the segment between the first set and the second set comprises a highly repulsive peptide region of the chosen protein", the repulsive peptide region being adjacent to the high affinity peptide regions.*

9. Claims 10, 12-17, 20, 24, 26, 29-34, 36, 40, and 75-77 are rejected under 35 U.S.C. 102(b) as being unpatentable over Georges et al. (Topology of P-glycoprotein as Determined by Epitope Mapping of MRK-16 Monoclonal Antibody, The Journal of Biological Chemistry 268 (3): 1792-1798 (1993)).

Georges teaches identifying a peptide in a chosen protein (human P-glycoprotein 1 or human P-glycoprotein 3) by synthesizing overlapping heptapeptides (7 amino acid length) spanning a complete sequence of a domain of the protein. The peptides are covalently attached to a solid support (plastic pins on a 96-well polypropylene plate). The support is incubated with a mixture of polypeptides (antibodies), washed to remove unbound polypeptides, and detected for binding of the labeled polypeptides with the peptides immobilized on support (ELISA: enzyme label) (see Abstract, page 1793, columns 1-2, and page 1796, column 2).

In as far as the recitation of high affinity peptide regions and repulsive peptide regions in claims 10 and 26, it is provided in the specification and the dependent claims, that use of overlapping heptapeptides (7 amino acid length) as taught by Georges, allows one to identify "a first set of contiguous overlapping peptides attached to a support ..." that binds a polypeptide, and "a second set of contiguous overlapping peptides attached to the support ..." that binds the polypeptide, the first set being discontinuous from the second set. It appears that the Georges reference which teaches synthesizing a plurality of peptide segments that overlap in parallel, the peptide segment range of which is 7 amino acids in length, reads on the claimed method since Georges provides hydrophilic peptide regions and hydrophobic peptide regions, wherein binding and non-binding occurs, respectively. As recited, the [high] affinity peptide region and [high] repulsive peptide region are consonant to Georges' hydrophilic and hydrophobic peptide regions, respectively, absent specific definition or determination of degree of affinity and degree of repulsion in the instant claims, which would render Applicant's claimed invention distinct from that taught by prior art. Perhaps, Applicant intends, *1) "determining that the first set [of contiguous overlapping peptides that bind the polypeptide] comprises a first region that binds to the polypeptide with a high affinity", 2) "determining that the second set [of contiguous overlapping peptides that bind the polypeptide] comprises a second region that binds to the polypeptide with a high affinity" ... the second set being discontinuous from the first set, and 3) "determining that the segment between the first set and the second set comprises a*

highly repulsive peptide region of the chosen protein", the repulsive peptide region being adjacent to the high affinity peptide regions.

Prior Art

10. Claims 23 and 39 are free of the prior art of record. Claims 23 and 39 are objected to as being dependent upon a rejected base claim.

Response to Arguments

11. Applicant's arguments with respect to claims 10, 12-17, 19, 20, 24, 26, 30-34, 36, 39, 40, and 75-77 have been considered but are moot in view of the new grounds of rejection.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gailene R. Gabel whose telephone number is (571) 272-0820. The examiner can normally be reached on Monday, Tuesday, and Thursday, 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gailene R. Gabel
Patent Examiner
Art Unit 1641
May 1, 2006